

WHAT IS CLAIMED IS:

1. An isolated and purified *Bacillus thuringiensis* crystal protein comprising the amino acid sequence of SEQ ID NO:34.

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2. The protein of claim 1, wherein said protein is insecticidally active against *Spodoptera frugiperda*, *Spodoptera exigua*, *Heliothis virescens*, *Helicoverpa zea*, or *Ostrinia nubilalis*.

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3. The protein of claim 2, wherein said protein is insecticidally active against *S. frugiperda* and *S. exigua*.

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4. The protein of claim 1, wherein said crystal protein is isolated from *Bacillus thuringiensis* EG11768 or NRRL B-21781.

5. A polynucleotide encoding the crystal protein of claim 1.

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6. The polynucleotide of claim 5, wherein said segment encodes a δ endotoxin having insecticidal activity against *Spodoptera frugiperda*, *Spodoptera exigua*, *Heliothis virescens*, *Helicoverpa zea* or *Ostrinia nubilalis*.

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7. The polynucleotide of claim 6, wherein said segment encodes a δ endotoxin having insecticidal activity against *Spodoptera frugiperda* and *Spodoptera exigua*.

8. The polynucleotide of claim 7, further defined as encoding a protein comprising the amino acid sequence of SEQ ID NO:34.

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9. The polynucleotide of claim 8, further defined as comprising the nucleic acid sequence of SEQ ID NO:33, or the complement thereof, or a sequence which hybridizes to the sequence of SEQ ID NO:33; under conditions of high stringency.

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10. The polynucleotide of claim 5, further comprising a recombinant vector.

11. The polynucleotide of claim 10, wherein said vector is pEG381.

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12. The polynucleotide of claim 11, wherein said polynucleotide is operatively linked to a promoter, said promoter expressing said polynucleotide.

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13. A recombinant host cell comprising the polynucleotide of claim 5.

14. The recombinant host cell of claim 13, further defined as a prokaryotic cell.

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15. The recombinant host cell of claim 14, wherein said prokaryotic cell is an *E. coli*, *B. thuringiensis*, *B. subtilis*, *B. megaterium*, or a *Pseudomonas* spp. cell.

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16. The recombinant host cell of claim 15, wherein said *B. thuringiensis* is *B. thuringiensis* EG11768 or NRRL B-21781.
- 5 17. The recombinant host cell of claim 13, defined further as being a eukaryotic cell.
18. The recombinant host cell of claim 17, further defined as a plant cell.
- 10 19. The recombinant host cell of claim 18, wherein said plant cell is a corn, wheat, oat, barley, cotton, soybean, maize, rye, turf grass, pasture grass, vegetable, berry, fruit, tree, or ornamental plant cell.
- 15 20. The recombinant host cell of claim 13, wherein said host cell expresses said polynucleotide to produce a crystal protein or peptide.
- 20 21. A method of using a DNA segment that encodes a crystal protein or peptide, comprising the steps of:
- (a) preparing a recombinant vector in which a crystal protein or peptide-encoding DNA segment is positioned under the control of a promoter;
- 25 (b) introducing said recombinant vector into a host cell;
- (c) culturing said host cell under conditions effective to allow expression of the encoded crystal protein or peptide; and
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(d) collecting said expressed crystal protein or peptide.

22. The method of claim 21, wherein said recombinant vector is pEG381.

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23. A peptide composition comprising a crystal protein having the amino acid sequence of SEQ ID NO:34.

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24. The peptide composition of claim 23, comprising a crystal protein encoded by the nucleic acid sequence of SEQ ID NO:33.

15 25. A purified antibody that binds to a crystal protein having the amino acid sequence of SEQ ID NO:34.

20 26. A method for detecting a crystal protein or peptide in a biological sample, comprising the steps of:

(a) obtaining a biological sample suspected of containing a crystal protein or peptide;

25 (b) contacting said sample with the antibody according to claim 25, under conditions effective to allow the formation of complexes; and

(c) detecting the complexes so formed.

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27. An immunodetection kit comprising, in suitable container means, the antibody according to claim 25, and an immunodetection reagent.
- 5 28. A transgenic plant having incorporated into its genome a transgene that encodes a crystal protein having the amino sequence of SEQ ID NO:34.
- 10 29. The transgenic plant of claim 28, wherein said transgene comprises the nucleic acid sequence of SEQ ID NO:33.
30. A progeny of the plant of claim 28.
- 15 31. A seed from the plant of claim 28.
32. A seed from the progeny of claim 30.
- 20 33. A plant from the seed of claim 32.
- 25 34. A recombinant host cell that produces a crystal protein comprising the amino acid sequence of SEQ ID NO:34.
- 30 35. The recombinant host cell of claim 34, wherein said crystal protein is encoded by the nucleic acid sequence of SEQ ID NO:33.

36. A *Bacillus thuringiensis* cell designated NRRL B-21781 or EG11768.
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37. A composition comprising from about 0.5% to about 99% by weight of a crystal protein having the amino acid sequence of SEQ ID NO:34.
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38. The composition of claim 37, comprising a crystal protein encoded by the nucleic acid sequence of SEQ ID NO:33.
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39. A composition comprising a crystal protein prepared by a process comprising the steps of:
- (a) culturing a recombinant host cell comprising the DNA segment of SEQ ID NO:33 under conditions effective to produce a crystal protein encoded by said DNA segment; and
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- (b) obtaining said crystal protein from said cell.
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40. A method of preparing a crystal protein comprising:
- (a) culturing a *Bacillus thuringiensis* EG11768 or NRRL B-21781 cell under conditions effective to produce a said crystal protein; and
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- (b) obtaining said crystal protein from said cell.

41. The composition of claim 37, prepared by the method of claim 40.